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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR		ATTORNEY DOCKET NO.
09/655,705	09/06/00	SUGIYAMA	N	28503.20058.

IM22/0410

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EXAMINER	
MACARTHUR, S	
ART UNIT	**PAPER NUMBER**
1763	4

DATE MAILED: 04/10/01

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

FILE COPY

Office Action Summary

Application N .	Applicant(s)	
09/655,705	SUGIYAMA ET AL.	
Examiner	**Art Unit**	
Sylvia R MacArthur	1763	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Peri d for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____ .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-11 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-11 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claims _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are objected to by the Examiner.

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

15)☒ Notice of References Cited (PTO-892)
16)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
17)☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
18)☐ Interview Summary (PTO-413) Paper No(s). _____ .
19)☐ Notice of Informal Patent Application (PTO-152)
20)☐ Other:

DETAILED ACTION

Claim Rejections - 35 USC § 102/103

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Alternatively, the following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1-11 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Cho et al (USP 5,441,568).

Cho illustrates a process chamber in Figure 1which includes an exhaust baffle 60. The baffle is superimposed over an exhaust plenum 23. The gas flow pattern across the exhaust baffle 60a is achieved by a novel placement of apertures 76-78, and includes two offest apertures in the form of passages 81 and 83. The baffle plate is shaped like a ring, and the plurality of slits is arranged radially on an entire circumferential surface of the baffle plate.

The bottom surface of the exhaust baffle bottom portion 72 abuts an upper exhaust plenum surface 26 to provide a substantially gas-tight seal. Cho cites that any or all of the apertures are formed through the exhaust baffle such that the inner surface of the aperture is oriented at an acute angle relative to the exhaust baffle surface. The baffle bottom portion passages 81,82 flare (tapered surface) somewhat as they extend from the apertures 81a, 82a until

they terminate as a wide, shallow slot having an open end that may be configured to face partially toward the substrate surface.

The dimensions of claims 1-11 are anticipated by the invention of Cho by Figures 1-7.

Alternatively, Cho fails to specifically disclose the dimensions of the tapered surface with respect to the slit nor angle θ.

Nevertheless, the determination of the optimal dimensions of the slits (including their depth and angle) is an obvious choice of design for one of ordinary skill in the art at the time the claimed invention.

It would have been obvious for one of ordinary skill in the art at the time of the claimed invention to design the baffle plate of Cho with the optimized dimensions of the Cho to promote a uniform gas flow pattern in the exhaust.

3. Claims 1-11 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Su (USP 5,589,002).

Su discloses a gas distribution plate for a semiconductor wafer process chamber has a symmetrical pattern of non-circular openings. At least some of the walls of the non-circular openings are not perpendicular to the plane of the face of the gas distribution plate 20, but are slanted, at an angle of from at least 30 degrees to less than 90 degrees, toward the center or axis of the outer face of the circular gas distribution plate which faces the wafer. Three arcuate slots 22a, 22b, and 22c are provided in an inner circular arrangement coaxial with the center of plate 20, with each arcuate slot occupying just less than 120 degrees (so that the slots are separated from one another), see col. 1 lines 28-49. In col. 4 liens 35-50 Su cites that the gas distribution plate 30 comprises arcuate slots 24a, 24b, and 24c, each having a length of less than $1/4\pi$ (xD),

where the value of x would depend upon the diameter of the circle defined by the coaxially positioned arcuate slots 44a-44d and D is the diameter of the gas distribution plate 30.

The dimensions of claims 1-11 are anticipated by the invention of Su Figures 1-8.

Alternatively, Su fails to specifically disclose the dimensions of the tapered surface with respect to the slit nor angle θ.

Nevertheless, the determination of the optimal dimensions of the slits (including their depth and angle) is an obvious choice of design for one of ordinary skill in the art at the time the claimed invention.

It would have been obvious for one of ordinary skill in the art at the time of the claimed invention to design the baffle plate of Su with the optimized dimensions of Su to promote a uniform gas flow pattern in the exhaust.

Conclusion

4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sylvia R MacArthur whose telephone number is 703-306-5690.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory L. Mills can be reached on 703-308-1633. The fax phone numbers for the organization where this application or proceeding is assigned are 703-305-3599 for regular communications and 703-305-3599 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.

Sylvia R. MacArthur
April 9, 2001

GREGORY MILLS
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1700